Finally, I understand that the Kew Committee are about to take in hand the subject of the progress of magnetic weather and to investigate it in a manner peculiarly suitable to an institution possessing relations with numerous self-recording magnetic observatories.

BALFOUR STEWART

NOTES

THE fund which has been established by the members of the Birmingham Philosophical Society for the endowment of original research already amounts to 700*l.* in donations, and to 70*l.* in annual subscriptions. Out of this a sum of 150*l.* per annum for three years has been voted to Dr. George Gore, F.R.S., which amount is, in the terms of the grant, placed at his disposal in order that he "may have greater facilities for continuing in Birmingham his original researches." The council of the society proposes to make other grants as soon as the funds will permit. We have already spoken of the enterprise and public spirit of this society in establishing the fund; it is gratifying that they have been able to make a beginning so speedily, and the success of the scheme cannot be doubted. Dr. Gore's address is now the Institute of Scientific Research, No. 67, Broad Street, Birmingham.

WE are glad to hear that Mr. L. Fletcher, M.A., Fellow of University College, Oxford, has been appointed to succeed Prof. Story-Maskelyne as keeper of the Mineral Department of the British Museum. Mr. Fletcher was appointed first assistant in the department a little over three years ago, and the energy and ability with which he discharged the duties of that appointment promise well for the future of the Mineral Department.

WE regret to have to announce the death of Mr. Henry Ludlam, which occurred last week from the rupture of a blood-vessel. He had been in failing health for some months, but seemed on the road to recovery when the hæmorrhage occurred. He was well known in the mineralogical world as one of the most assiduous and able of private collectors, and his valuable collection was one of the objects of interest which foreign mineralogists visiting this country wished to consult. He has carried out his intention, announced several years ago, of bequeathing the collection to the Jermyn Street Museum. This gift will render the collection of this museum second only to that of the British Museum, and will, in fact, render it a formidable rival in the case of some of the rarer and more beautiful minerals. Mr. Ludlam was always willing to allow his mineralogical friends to consult his collection, and also frequently supplied them with specimens for examination.

THE Council of the Society of Arts have awarded medals to the following gentlemen for papers read during the session which is just over:—Major-General H. Y. D. Scott, C.B., F.R.S., for his paper on "Suggestions for Dealing with the Sewage of London;" A. J. Ellis, F.R.S., for his paper on "The History of Musical Pitch;" John Sparkes, for his paper on "Recent Advances in the Production of Lambeth Art Pottery;" Henry B. Wheatley, F.S.A., for his paper on "The History and Art of Bookbinding;" W. Holman Hunt, for his paper on "The Present System of Obtaining Materials in use by Artist Painters, as compared with that of the Old Masters;" Thomas Fletcher, for his paper on "Recent Improvements in Gas Furnaces for Domestic and Laboratory Purposes;" John C. Morton, for his paper on "The Last Forty Years of Agricultural Experience;" Prof. Heaton, F.C.S., for his paper on "Balmain's Luminous Paint;" Capt. Abney, R.E., F.R.S., for his paper on "Recent Advances in the Science of Photography."

LORD NORTON has all along protested that he is not unfavourable to the teaching of science in elementary schools, and is evidently hurt at the incredulity with which his protestation is received by those one-sided individuals who persist in judging his intentions by his actions, and not his words. He is evidently of opinion that the only difference between himself and those who would maintain the Code unaltered, is one of method. There are people so benighted as to believe that as science deals with *things*, it is hopeless to teach it apart from these things; who believe that if you want to make children know what a daisy or a buttercup is like, and to understand its structure, the shortest and most effectual way is to show them the flower and take it to pieces in some sort of systematic way before their eyes. But these people are all wrong. Why should children and teachers put themselves to the trouble of soiling their hands by pulling to pieces nasty weeds, when the thing can be much better done from books? Lord Norton, as we learn from a contemporary, has resolved to triumphantly refute these deluded people, by himself compiling a series of reading lessons in botany, warranted to teach the children of our elementary schools all that it is safe and wholesome for them to know. Evidently modern science and its methods are all wrong; books, after all, are the only instruments of education, and the sooner we make a holocaust of all modern scientific implements and methods the better. Might we suggest to Lord Norton that after he has completed his botanical enterprise he might compile a series of lessons in engineering civil and mining, for the purpose of saving the neophytes in these departments the necessity for spending their time in sooty workshops and stifling mines? In fact there seems no end to the enterprise which Lord Norton is about to "inaugurate;" if he is able to carry it on to completion, he will probably earn for himself a right to be considered the most remarkable educationist of his time. In the meantime Her Majesty's reply to the address which the Lords were persuaded to adopt is virtually a quiet snub; while in the Commons Mr. Mundella has declared that the Government have no intention of lowering the standard of education in the country. Does not this look rather bad for the success of Lord Norton's projected compilation?

IT is a tacitly-accepted practice, and one so beneficial to student-readers as to be almost imperative, that writers of original scientific memoirs should, wherever their researches touch upon common ground with those of older workers of standing, give references (at the very least in a decent foot-note) by which the student may be able to turn at once to the *ipsissima verba* of the possible authorities. We regret to notice an increasing tendency of late to slovenliness in the way of making such references on the part of some of the younger generation of enthusiastic would-be discoverers. Even the *Proceedings* of the Royal Society itself are not exempt from this modern weed, for in a recent paper we find the following given as references:—*Phil. Mag.*, 1850, *Pogg. Annalen*, 1858, and—for an important deduction from a paper by Clausius—*Phil. Mag.*, 1851. Is it too much to request the writers of Royal Society papers to be at least a little more explicit in their allusions? We cannot suppose that such references are made vague with any sinister purpose.

DR. P. P. C. HOEK of Leiden writes:—"The zoological station of the Netherlands Zoological Society for the summer months of this year is erected in the neighbourhood of Nieuwediep Harbour. The use of the station is free to the members of the Society and to strangers introduced by one of the members. The laboratory is furnished as completely as possible with all the implements—optical and steel instruments excepted—necessary for anatomical, histological, and embryological researches; it contains also a small collection of books necessary for a preliminary investigation and determination of the animals collected, &c. Special arrangements of a very simple but practical kind serve to keep alive the collected animals. Smaller and larger excursions are organised every year by the station, and for these it always has at its disposal pilot-boats and other small vessels of the Dutch marine. Since its opening, in the summer of 1876, the station has repeatedly received proofs of appreciation from different quarters. Thus on the Scotch coast a similar station has been erected after the drawings and notes furnished by the Dutch Society; the International Exhibition of Fish and Fisheries, this year held in Berlin, rewarded the practical side of the institution with a silver medal. Further particulars may be obtained from the Secretary of the Commission for the Zoological station."

Dr. Hermann Müller's long-promised work on Alpine Flowers is being printed, and will be published towards the end of the year.

Mr. Daniel Grant has given notice that he will to-day ask the First Commissioner of Works whether he will take into his consideration the advisability of substituting the electric light for the purpose of illuminating the House in place of the gas now used in the roof.

The annual exhibition of the Photographic Society at Pall Mall will open on Saturday, October 2, and close on November 13. Friday, September 24, is the last day on which pictures can be received.

The *Times* Geneva correspondent writes under date June 20 that a remarkable electrical phenomenon occurred at Clarens on the afternoon of Thursday last. Heavy masses of rain-cloud hid from view the mountains which separate Fribourg from Montreux, but their summits were from time to time lit up by vivid flashes of lightning, and a heavy thunderstorm seemed to be raging in the valleys of the Avants and the Alliaz. No rain was falling near the lake, and the storm still appeared far off, when a tremendous peal of thunder shook the houses of Clarens and Tavel to their foundations. At the same instant a magnificent cherry-tree near the cemetery, measuring a metre in circumference, was struck by lightning. Some people who were working in a vineyard hard by saw the electric "fluid" play about a little girl who had been gathering cherries and was already 30 paces from the tree. She was literally folded in a sheet of fire. The vine-dressers fled in terror from the spot. In the cemetery six persons, separated into three groups, none of them within 250 paces of the cherry-tree, were enveloped in a luminous cloud. They felt as if they were being struck in the face with hailstones or fine gravel, and when they touched each other sparks of electricity passed from their finger-ends. At the same time a column of fire was seen to descend in the direction of Chatelard, and it is averred that the electric fluid could be distinctly heard as it ran from point to point of the iron railing of a vault in the cemetery. The strangest part of the story is that neither the little girl, the people in the cemetery, nor the vine-dressers appear to have been hurt; the only inconvenience complained of being an unpleasant sensation in the joints, as if they had been violently twisted, a sensation which was felt with more or less acuteness for a few hours after. The explanation of this phenomenon is probably to be found in Prof. Colladon's theory of the way in which lightning descends, as described in Nature, vol. xxii. p. 65. The Professor contends that it falls in a shower, not in a perpendicular flash, and that it runs along branches of trees until it is all gathered in the trunk, which it bursts or tears open in its effort to reach the ground. In the instance in question the trunk of the cherry-tree is as completely shivered as if it had been exploded by a charge of dynamite.

The number of lions in Algeria is fast diminishing, and it is expected that the animal will soon be extirpated from the colony. As there is an increasing demand for public exhibitions at fairs and zoological gardens, an establishment has been formed at Bona, by a private individual, for lion-breeding.

The Commission for the construction of the Trans-Saharan Railway has determined that this great work shall be preceded by the establishment of a telegraph line connecting Algiers with St. Louis in Sengal *viâ* Timbuctoo.

We hear that Mr. J. R. Gregory, the well-known mineral dealer in London, has been awarded at the Sydney Exhibition a *first class*—equal to a gold medal—and a *third class*, for his collections of minerals and fossils, and geological collections.

We are asked to state that the business of Messrs. R. and J. Beck, the manufacturing opticians, has been removed from No. 31, Cornhill, to No. 68, Cornhill.

The success achieved by M. Paul Desmarets in his balloon photographs, to which we referred last week, has created some sensation in the scientific world of Paris. The photographs obtained by him at Rouen were exhibited and explained by M. de Fonvielle in a lecture delivered at Versailles Mairie on June 22, at a sitting of the Société des Sciences Naturelles. They have been presented by MM. Paul Desmarets and Jovis to the Minister of War; M. Janssen will present them at the Academy of Sciences, and M. W. de Fonvielle to the Geographical Society. One of the photographs will be published next Saturday in the *Monde Illustré*, having been photographed on wood and engraved. The electrical apparatus which enabled M. Paul Desmarets to obtain his *clichés*, and the obturators have a weight of 700 grammes only, including the elements required. Steps are being taken for the systematic photographing of Paris and vicinity. One plate shows a piece of land covered with houses, gardens, and roads in the vicinity of Rouen, measuring 300 yards by 300 yards, and executed on the scale of $\frac{1}{800}$. The altitude was about 1,100 metres. The second photograph was in the direction of W.N.W., facing the horizon. All the Seine, from Rouen Railway Bridge to Guellebœuf, is seen with wonderful distinctness. The city of Rouen was concealed by a dense cloud, and is lost in darkness. The details on the banks can be magnified and examined at leisure. This remarkable ascent was made from Rouen on June 14, with *Gabriel*, a new balloon of 1,200 cubic metres belonging to M. Tovis, and built for the express purpose of crossing the Channel, weather permitting. It is owing to the uncertainty of the weather that this enterprise, of which we have spoken already, has been postponed.

We learn from a circular forwarded to us that the Epping Forest and County of Essex Naturalists' Field Club will hold their next Field Meeting on Saturday afternoon, July 3, for the purpose of thoroughly inspecting the ancient earthworks of Ambresbury Banks and Loughton. The archæological conductor for the occasion is Major General Pitt-Rivers, F.R.S.

M. Tessie du Motay, a French chemist who had invented a continuous process for the preparation of oxygen gas and apparatus for oxyhydric lighting, has recently died at New York at the age of sixty-two.

The excursions arranged for by the Geologists' Association are to Maidstone on July 10, Leith Hill and Dorking July 24, and Bristol on August 16 and five following days.

On Tuesday evening Signor Alberto B. Bach gave a lecture at the Royal Academy of Music on the cultivation of the voice, and on his invention, the Resonator, an instrument somewhat of the nature of an artificial palate, intended to increase the power of the voice without any additional expenditure of breath.

Natural caverns of enormous size—one being 600 feet long—have been discovered within the last few days in the neighbourhood of West Harptree, near Wells, in Somerset. The investigations are still being carried on, and the discoveries have excited some interest among antiquaries and archæologists.

IN a paper read at the last meeting of the Statistical Society, by Mr. R. Price Williams, C.E., "On the Increase of Population in England and Wales," the author said the total increase of the population of England and Wales during the whole of the last century was only 3,417,536, the average decennial rate of increase being nearly 5 per cent., whereas during the present century, up to 1871, there was an increase of nearly 14 millions, the average decennial rate of increase being over 14 per cent. The rate of increase in the decade 1811-21 was the maximum attained in this century, viz., 18 per cent., as from that period down to the census of 1861 the rate of increase of the population had continuously diminished. He observed that a great increase of the population took place at the time when steam-power began to be used for manufacturing purposes, and while the towns increased, the rural districts were found to diminish. Mr. Williams estimates that the population of England and Wales by the census of 1881, will be 25,735,900. In the case of the population of London the decrements were very slight indeed, showing that it had not reached that declining stage in the rate of its increase long since arrived at in the case of Liverpool, Manchester, and many other large towns. The population of London had increased from 958,863 in 1801 to 3,251,913 in 1871. He did not think there was sufficient data for estimating the future increase of the population of London for any lengthened period, and he regarded as unreliable the enormous estimates which had recently appeared in connection with the question of the water supply of the metropolis, where the population in the course of the next century was estimated at over 17 millions.

THE Thirteenth Annual *Report* of the Peabody Institute of Baltimore testifies to the increasing usefulness of that institution, both as a library and as a centre of varied instruction. Among its means of usefulness are a series of lectures, many of which are on scientific subjects.

WE have received the *Report* of the South African Museum for 1879, from which we are pleased to see that the Museum is in a fairly flourishing condition. A long list of additions during the year is appended.

THE May and June numbers of the Friends' Schools' *Natural History Journal* contain much interesting matter, the local papers being specially valuable.

THE additions to the Zoological Society's Gardens during the past week include an Arabian Gazelle (*Gazella arabica*) from Arabia, presented by Capt. Titus; a Common Genet (*Genetta vulgaris*), South European, presented by Mr. G. H. Thunder, R.N.; an Emu (*Dromæus novæ-hollandiæ*) from Australia, presented by Mr. A. McIlwraith, F.Z.S.; a Greater White-crested Cockatoo (*Cacatua cristata*) from Moluccas, presented by Mrs. A. L. Chetwode; three Red-beaked Weaver Birds (*Quelea sanguinirostris*) from West Africa, presented by the Marchioness of Westminster; a Crested Ground Parrakeet (*Calopsitta novæ-hollandiæ*) from Australia, presented by Miss M. S. Spooner; a Barbary Ape (*Macacus inuus*) from North Africa, an Occellated Monitor (*Monitor ocellata*) from West Africa, deposited; three Ruddy Sheldrakes (*Tadorna rutila*), European, two Sandwich Island Geese (*Bernicla sandvicensis*) from the Sandwich Islands, two Blood-rumped Parrakeets (*Psephotus hæmatonotus*) from Australia, two Celebean Rails (*Rallus celebensis*) from Celebes, purchased; a Collared Fruit Bat (*Cynonycteris collaris*), a Japanese Deer (*Cervus sika*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE THIRD COMET of 1822.—Neither Galle in his catalogue, nor Karl in his *Repertorium der Cometen-Astronomie*, refers to any observations of this comet except the imperfect ones made by Caturegli at Bologna, and two by Gambart at Marseilles, and the only orbits found in the catalogues are the two calculated by Heiligenstein. The comet was however observed at Rio de Janeiro, from June 18 to June 24, and Henderson reduced the observations, which were made by Lieut. Robertson, R.N., and calculated an approximate orbit upon them. The comet approached near to the earth, and is of some interest upon that account. Mr. Hind has combined the observations of both hemispheres, and with the following results for the elements of the orbit: Henderson's numbers, not being found in our catalogues, are annexed:—

	HIND.		HENDERSON.
Perihelion passage	July 15·8442 G.M.T.	...	July 15·651 G.M.T.
Long. of perihelion	219° 59′·4	...	220° 19′ 49″
,, Ascending node	97 44·3	...	98 14 47
Inclination of orbit	36 17·5	...	35 36 0
Log. perihelion distance ...	9·92797	...	9·92879

Motion—retrograde.

Henderson's paper upon this comet will be found in the *Philosophical Transactions* for 1831. On June 18 the comet was in opposition to the sun, distant from the earth 0·14. Though it was discovered by Pons at Marlia on May 30, we have no observation previous to June 8. Pons at the time was not provided with instruments competent to fix the positions. Zach writes of the comet at the time of discovery that it was without tail or nucleus, simply a nebulosity more condensed towards the centre. Pons thought that in the absence of moonlight it would have been visible without the telescope. He was then on the watch for Encke's comet, which, though not observed in Europe, was closely followed by Rümker at Paramatta, N.S.W.

THE DOUBLE-STAR 85 PEGASI.—Mr. Burnham publishes measures of the small and close companion of this star made in the summer of 1879, which, compared with those he obtained the previous year when he detected this very faint object, establish its physical relation to the principal star, since it is shown to partake of its large proper motion, while a suspicious difference of 10° between the means of the measures in 1878 and 1879 points to its binary character. These means are as follow:—

1878·43	...	Position	274·0	...	Distance	0″·67	... 3 nights
1879·46	...	,,	284·6	...	,,	0·75	... 5 nights

Mr. Burnham estimates the magnitude of the close companion about the twelfth on Struve's scale, and considers it will require an aperture of at least twelve inches to show it. He has also measured the distant companion which was used by Prof. Brünnow in his investigation of the parallax of 85 Pegasi, which he made to be 0″·054. This star was observed with 85 at Königsberg by Bessel on October 6, 1825, when it followed 61″·95 in R.A., and was 38″·6 south of the bright star. If we compare these differences with those corresponding to Mr. Burnham's measures at the epoch 1878·95, and assume the fixity of the companion, we shall find for the secular proper motion of 85 Pegasi in R.A. + 100″·1, and in Decl. − 96″·1, agreeing precisely with the values resulting from a comparison of the meridian observations. If, as Prof. Brünnow hinted, there is proper motion of the distant companion, its amount would appear to be very minute. Mr. Burnham adds that there are but two other stars on our lists similar in character to 85 Pegasi, viz., η Piscium and β Scorpii; all three were detected by him with the 18-inch Chicago refractor.

A VARIABLE STAR IN AQUARIUS.—The star observed on six nights at Bonn, in 1863, in R.A. 22h. 28m. 16·9s. N.P.D. 98° 21′ 19″ for 1855·0, is variable from 9m. to invisibility in a 7-inch aperture. Argelander noted it four times 9·5, once 9·6, and once 10·0. It was observed at Markree as a 9m. on October 27, 1848, on August 26, 1852, it was 11m., and on November 9, 1874, it was invisible. On September 21, 1876, it was 11·12. It has at times a hazy blurred appearance, as remarked in several other variable stars. This star was long since indicated as variable, but appears to have escaped attention from most observers of this class of objects.

GEOGRAPHICAL NOTES

DR. FRANCISCO PEREIRA PASSOS, Director of the Brazilian State Railways, has recently caused to be prepared and published a map showing the existing and projected railways in the provinces of Rio de Janeiro, Minas, and San Paulo. This map is